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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/172,553	10/14/1998	JAMES E. GREEN	2914.IUS	9441

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EXAMINER

DIAZ, JOSE R

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 04/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/172,553

Applicant(s)

GREEN ET AL.

Examiner

José R Díaz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-35 and 37-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-35, 37-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

- The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- Claims 33-34, 37-41 and 44-45 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claimed steps of providing a HSG polysilicon layer on the storage poly structure and lining the recesses with a dielectric material are not supported by Applicant's Specification. See *Response to Arguments*, below.

Claim Rejections - 35 USC § 102

- The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- Claims 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Wood et al. (US Patent No. 5,405,799).

Regarding claims 31-32, Wood et al. teach a semiconductor capacitor storage poly (see Figure 2) comprising: downwardly extending recesses (see Figure 6); and a plurality of contiguous mesas (18,19) extending in the X, Y and Z coordinates (see Figure 6) and comprising a plurality of contiguous top surfaces (18, 23) forming a maze-like structure (see Figures 2 and 10).

Regarding claims 33-34, Wood et al. teach a semiconductor capacitor storage poly (see Figure 2) comprising: downwardly extending recesses (see Figure 6); a plurality of contiguous mesas (19, 23) extending in the X, Y and Z coordinates and forming a maze-like structure (see Figures 2 and 6) and hemispherical-grain polysilicon (18) on at least some of said plurality of contiguous top surfaces (see Figures 6 and 10).

Regarding claims 35, Wood et al. teach an intermediate semiconductor capacitor structure (see Figure 8) comprising: a storage poly structure (16, 19) with recess formed therein (consider the space between the mesas 19 in Figure 8); a contiguous hemispherical-grain polysilicon (18) over said storage poly structure (see Figures 8 and 10) and a mask (20, 21) over said hemispherical-grain polysilicon layer, said recesses (consider the recess not covered by the mask (20, 21)) being exposed through said contiguous hemispherical-grain polysilicon (18) and said mask (20, 21) (see Figure 8).

➤ Claim 35 and 37-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Kenney (US Patent No. 5,254,503).

Regarding claims 35, 42 and 43, Kenney teaches an intermediate semiconductor capacitor structure (see Figure 4) comprising: a storage poly structure (10) with recess

(20) formed therein (see Figure 4); a contiguous hemispherical-grain polysilicon (14) over said storage poly structure (see Figures 1-4) and a mask (16, 18) over said hemispherical-grain polysilicon layer (see Figures 1-4), said recesses (20) being exposed through said contiguous hemispherical-grain polysilicon (14) and said mask (18) (see Figure 4).

Regarding claim 37, Kenney teaches an intermediate semiconductor capacitor structure (see Figure 4 and 6) comprising: a storage poly structure (10); low elevation regions of a hemispherical-grain polysilicon (14) on said storage poly structure; recesses (20) formed in said storage poly structure and located laterally between said low elevation regions of said hemispherical-grain polysilicon layer (see Figure 4); and a dielectric material (22) at least lining the recesses (see Figure 6).

Regarding claims 38, 40, 44 and 45, Kenney teaches an intermediate semiconductor capacitor structure (see Figure 4 and 6) comprising: a storage poly structure (10); low elevation regions of a hemispherical-grain polysilicon (14) on said storage poly structure; recesses (20) formed in said storage poly structure and located laterally between said low elevation regions of said hemispherical-grain polysilicon layer (see Figure 4); and a dielectric material (22) substantially coating an upper surface of said storage poly structure and lining each of said plurality of recesses (see Figure 6).

Regarding claim 39, Kenney teaches a cell poly structure (24) over the dielectric layer (see Figure 6).

Regarding claim 41, Kenney teaches that at least some of the plurality of recesses (20) extends into said storage poly structure (10) (see Figure 4).

➤ Claim 42 is rejected under 35 U.S.C. 102(b) as being anticipated by Ahn et al. (US Patent No. 5,358,888).

Regarding claim 42, Ahn et al. teach a semiconductor capacitor storage poly (see Figure 17) comprising: a storage poly structure (40, 50), a substantially confluent HSG layer (80), and a mask (70, 56), wherein elevated portions of said HSG are exposed downwardly extending recesses (consider the HSG not covered by the mask 70, 56 in Figure 17).

Response to Arguments

➤ Applicant's arguments filed January 27, 2003 have been fully considered but they are not persuasive.

- Rejections under 35 U.S.C. § 112, First Paragraph

Applicant argues in the remarks that the specification and figures do not create an ambiguity. However, the examiner disagrees. The first paragraph of § 112 requires "a written description of the invention, and of the manner and process of making and using it, in such **full, clear, concise**, and **exact** terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention." [Emphasis added]. In the instance case, Applicant fails to provide a full and clear written description of whether the HSG polysilicon remains or is removed prior to the deposition of the dielectric layer 138 shown in Figure 10. In order to clarify this

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ambiguity, Applicant cites the passage on page 8, lines 20-21 of the specification. However, such passage does not provide a teaching that clarifies the created ambiguity. As a matter of fact, it seems that Applicant acknowledges this deficiency in his remarks by always using ambiguous terms such as "appear" (response page 6) and "may remain" (response page 7), which indicate only a possibility that HSG polysilicon may or may not remain. It is noted¹ that merely because a step is possible is not a sufficient indication to a person skilled in the art that such a step is part of the applicant's invention. See *In re Barker and Pehl*, 194 USPQ 470 (CCPA 1977) citing *In re Smythe* 480, F.2d 1376, 178 USPQ 279 (CCPA 1973).

The MPEP states that a written description requirement issue involves the question of "whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention now claimed." [Emphasis added]. See MPEP 2163.02. Further, the MPEP states that "an applicant shows possession of the claimed invention by describing the claimed invention with all its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention." *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). [Emphasis added]. See MPEP 2163.02. In the instance case, it is the figures of applicant's disclosure that make clear that applicant does not have possession of the claimed invention. For example, figure 7 shows the presence of layer 130, which is comprised of HSG polysilicon 122 and mask 124; figure 9 shows that the layer 130 is removed; and figure 10 shows the deposition of the dielectric layer 138. Thus, it is clear

from the teaching provided by the drawings that the HSG polysilicon 122 is removed prior to the dielectric layer 138 being formed. Please note that a second embodiment is shown in Figures 11-21, however the figures show the same step as shown in Figure 9 and 10, in which the HSG polysilicon 122 is removed from the substrate before the dielectric layer is deposited (see for example figures 20-21). Thus, applicant does not have possession of the claimed invention since contrary to what is claimed the HSG polysilicon is in fact removed prior to the deposition of the dielectric layer. As such, the rejection under 35 U.S.C. § 112, First Paragraph is considered to be proper.

- Rejections under 35 U.S.C § 102 (b)

With regards to arguments against the reference Wood et al., please refer to Figure 2 and 10, wherein the required maze-like structure is clearly shown.

With regards to arguments against the reference Kenney, Figure 4 clearly shows that the HSG layer (14) is formed directly over the poly structure (10) and share the same upper surface of the poly structure (10), which agrees with the definition of the term "contiguous" as stated in the Office action mailed on June 25, 2002.

With regards to arguments against the reference Ann et al., Figure 17 clearly shows that the HSG layer (80) is formed over the poly structure (40, 50) and share the same upper surface of the poly structure (40, 50), wherein at least two consecutives grains (80) share the same boundary or meet at one point, which agrees with the definition of the term "substantially confluent" (see page 242 of Merriam-Webster's Collegiate Dictionary, 10 ed. 1998).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00-5:00 Monday, Tuesday, Thursday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-3891 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD

March 31, 2003

A handwritten signature in black ink, appearing to read 'Eddie Lee', is positioned above the printed name and title.

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800